

Application No. 09/784,076
Amendment dated 7/9/04
Reply to Office Action of February 9, 2004

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (currently amended) A process for preparing polysulfides for use in a Kraft cooking liquor, comprising:

- a) providing a liquor in the absence of lime mud, the liquor having therein sodium sulfide, oxygen and a transition metal oxide catalyst; and
- b) reacting the sodium sulfide with the oxygen in the presence of the transition metal oxide catalyst, with the concentration of the catalyst in the liquor ranging from 0.05 0.25 to 6.5 g/l, where the consumption rate of O₂ is at least 1.5×10^{-4} moles/l/sec, such that a selectivity of polysulfides greater than 65% is achieved.

Claim 2 (original) The process of claim 1, wherein the consumption rate of O₂ is at least 2×10^{-4} moles/l/sec.

Claim 3 (original) The process of claim 1, wherein the consumption rate of O₂ is at least 4×10^{-4} moles/l/sec.

Claim 4 (original) The process of claim 1, wherein the reaction is conducted in a self-recirculated reactor.

Claim 5 (original) The process of claim 4, wherein the reactor is a hollow shaft reactor.

Claim 6 (original) The process of claim 1, wherein the transition metal oxide is MnO₂.

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Claim 7 (original) The process of claim 1, wherein the consumption rate of oxygen is controlled through the control of the partial pressure of oxygen in the reaction.

Claim 8 (original) The process of claim 4, wherein the consumption rate of oxygen is controlled through the control of the partial pressure of oxygen in the reaction.

Claim 9 (original) The process of claim 1, wherein the temperature at which the reaction is conducted is in the range of from about 70 to 99°C.

Claim 10 (original) The process of claim 1, wherein the temperature at which the reaction is conducted is in the range of from about 75 to 85°C.

Claim 11 (original) The process of claim 1, wherein the temperature at which the reaction is conducted is in the range of from about 75 to 80°C.

Claim 12 (previously presented) The process of claim 4, wherein the retention time in the reactor is from about 2 to 15 minutes.

Claim 13 (original) The process of claim 12, wherein the retention time ranges from about 3 to 10 minutes.

Claim 14 (original) The process of claim 12, wherein the retention time ranges from about 3 to 5 minutes.

Claim 15 (currently amended) The process of claim 4, wherein the oxygen consumption is greater [[than 4×10^{-4} moles/l/sec]] than 4×10^{-4} moles/l/sec.

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Claim 16 (original) The process of claim 1, wherein the selectivity is greater than 75%.

Claim 17 (original) The process of claim 1, wherein the selectivity is greater than 90%.

Claim 18 (currently amended) A process for preparing polysulfides for use in a Kraft cooking liquor, comprising:

- a) providing a liquor in the absence of lime mud, the liquor having therein Na₂S, oxygen and a transition metal oxide; and
- b) reacting the Na₂S with the oxygen in the presence of the transition metal oxide, with a concentration of the metal oxide in the liquor ranging from 0.5 to 6.5 g/l, and where the consumption rate of O₂ is sufficient and the partial pressure of oxygen is controlled to achieve a selectivity of polysulfides greater than at least 60%.

Claim 19 (canceled)

Claim 20 (original) The process of claim 18, wherein the reaction is conducted in a self-recirculated reactor.

Claim 21 (original) The process of claim 18, wherein the reaction is conducted in a hollow shaft self-recirculated reactor.

Claim 22 (original) The process of claim 18, wherein the transition metal oxide is MnO₂.